DOCUMENT RESUME

ED 087 286 HE 005 081

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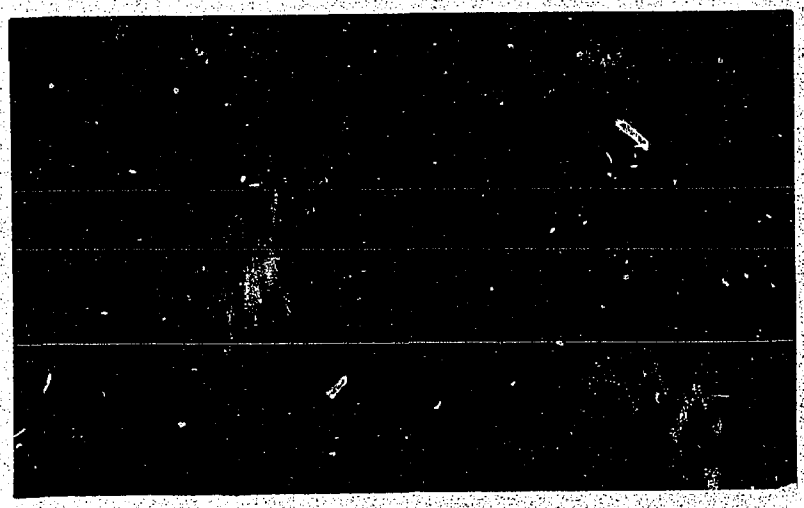
TITLE Analysis of Student Performance on the Undergraduate Record Examinations (1973).
INSTITUTION Bowling Green State Univ., Ohio.
PUB DATE Oct 73
NOTE 16p.

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS *Academic Achievement; *College Students; *Higher Education; Interdisciplinary Approach; Research Projects; Schedule Modules; *Student Ability; *Student Development
IDENTIFIERS MAP; *Modular Achievement Program

ABSTRACT

This report examines the performance of students in the Modular Achievement Program (MAP) at Bowling Green State University using the Undergraduate Record Examinations (URE) as the primary criterion. The performances of students in MAP on the URE is delineated and compared to the performance of freshman and sophomore norm groups at Bowling Green State University as well as the national sample. Results indicated MAP students as a group scored between the freshman and sophomore norm groups, which were recruited in a random fashion. When compared to national norms, the MAP students did very well, scoring higher as a group than sophomores in a national sample. No large differences appeared among students when they were compared according to their exact curricular experience. Related documents concerning components of the MAP program are HE 005 102, 005 083, 005 078, 005 082, 005 080, 005 101, 005 077, and 005 079. (Author/MJM)





# Modular Achievement Program/Bowling Green State University

# Analysis of Student Performance on the Undergraduate Record Examinations (1973)

James L. Litwin
October, 1973

In its prospectus submitted to the Academic Council, the staff of the Modular Achievement Program (MAP) suggested that performance on the Undergraduate Record Examinations (URE) should be the primary criterion by which a student would be recommended for advanced status. This report delineates the performance of students in MAP on the URE, and compares this performance with that of freshman and sophomore norm groups at Bowling Green State University, as well as a national sample. It also reports on the performance of MAP students separated according to the specific curriculum track they experienced during the year.

Background

Early in the academic year, the Modular Achievement Program Development and Evaluation Committee (the policy-making body of MAP) decided that if a student in MAP was to be recommended for advanced status, the recommendation ought to be made on the basis of an outstanding set of achievements during the freshman year. One of these achievements was to be a performance on comprehensive examinations in the area of general education equal to the average performance of sophomores at the university. At the same time, the Committee also wanted to test the assumption that students in MAP performed as a group no worse than other freshmen who had experienced more standard curricula. If such was the case this would provide assurance to the larger academic community that students in MAP possessed the standard academic skills, and that the process-oriented curriculum of MAP did not detract from those skills.

With this in mind, MAP asked its students to take a set of nationally

recognized examinations, and also took the same request to random samples of freshmen and sophomores at the end of the 1972-73 academic year.

The Undergraduate Record Examinations

It was decided that the Undergraduate Record Examinations published by the Educational Testing Service were appropriate for our purposes. The only other set of examinations which were seriously considered were the CLEP examinations. After a review of the two sets of exams by faculty and MAP staff, we concluded that the URE was similar to the corresponding CLEP exams in both the material covered and difficulty. In fact, the scores on the URE examination had been statistically equated with the CLEP exams and score conversion tables were available. The fact that the URE was significantly less expensive and time consuming to administer was another contributing factor to its selection.

The basic purpose for which the URE was designed also was congruent with our purpose: to assess student achievement in undergraduate work and competence for further study. The Undergraduate Record Examinations measured general knowledge in three broad areas: the humanities, the social sciences, and the natural sciences. A summary statement of the content of each of the three tests is provided on the next page.

Scores on the tests range from 205 to 910; although in each case the range is wide, few students receive scores at either extreme. The realiability coefficients of each of the exams appeared satisfactory to the committee: Humanities (.87), Natural Science (.88), and Social Science (.90).

The Humanities Test provides a means for measuring undergraduate familiarity with philosophy, literature, and other major arts. It draws on the student's acquaintance with individual figures and works, with historical periods and styles, and with common terms of criticism and analysis. The test emphasizes the kind of information and ability that many students with active but nonspecialized interests in the humanities are likely to have acquired, possibly through independent reading or informal exposure to the arts and to discussion of philosophical ideas. Historically, the topics covered range from the classical through the contemporary periods and represent both American and European traditions. Oriental materials appear only occasionally.

The Natural Science Test measures both the knowledge acquired in nonspecialized science courses and the science abilities related to the use of that knowledge. The science abilities considered in designing the test are (1) the ability to demonstrate knowledge of significant subject matter, (2) the ability to interpret scientific observations and experiments, and (3) the ability to interpret scientific equations, graphs, and charts. The questions are based in about equal numbers on the biological sciences and on the physical sciences including physics, chemistry, astronomy, and the earth sciences. Emphasis is on the great ideas of these sciences.

The questions in the Social Science Test sample the fields of history, geography, economics, sociology, political science, anthropology, and social psychology. Over all these areas the test gives approximately equal weight to social, political, and economic processes, institutions, and problems. Questions are designed to measure the student's understanding of fundamental terms and concepts and his knowledge of historical trends. The test also measures the ability to recognize central issues, assess the adequacy of data, recognize trends and project hypotheses from data, and evaluate material on the basis of given standards.

Subjects

Three distinct groups took the Undergraduate Record Examinations. One was composed of the MAP population, the other two were made up of randomly selected end-of-the-year freshmen and sophomores. 127 of the approximate 185 students in MAP at that time, decided to take the Undergraduate Record Examinations. One could assume that these students felt either (1) they had a reasonable chance to put scores into their portfolio which helped make the case for an accelerated degree for them or (2) they took the examinations as part of an obligation to the MAP project to continue the evaluation of the program. These 127 students represented 68% of the MAP population.

In the norm group populations the groups were recruited from university rosters listing full-time freshmen who had achieved between 30 and 40 hours and full-time sophomores who had achieved between 75 and 85 hours before the Spring Quarter began. A stratified sampling technique was used which approximated the distribution of MAP students in their college affiliation (Arts and Science = 50%; Education = 30%; Business Administration = 20% ). 150 students from each of these rosters were asked to participate in the project.

40% of the freshmen group agreed to participate in the project (N=60), and 53% of the sophomore group agreed to participate (N=86). The breakdown of each of these norm groups according to college affiliation is reported in Table 1.

Table 1: College Affiliation of Norm Groups

| | Arts & Sciences | Education | Business Administration |
|---|---|---|---|
| Freshmen (N = 60) | 26 (43%) | 20 (33%) | 14 (23%) |
| Sophomores (N = 86) | 45 (52%) | 25 (29%) | 16 (19%) |

Procedure

On the weekend of May 19-20 students in all three groups were given the URE. The normative groups took the examinations on a Saturday afternoon and the MAP population took it on a Sunday afternoon. The examinations were closely monitored according to ETS instructions. The examinations were then collected and sent back immediately to the Educational Testing Service for scoring.

The motivational question was a bothersome one. A student in MAP could perceive the test as being the means of advanced status which would result in considerable financial savings. Students in the norm group did not have this option (this would not have been relevant to sophomores in any case). However, in an attempt to provide more possible motivating factors for the student in the norm group, students were told that those who scored at the 50 percentile or above in their respective norm group would receive a letter to be deposited in their college folder acknowledging such an achievement. Earlier, all students in the norm groups had been told an initial letter noting their contribution to an important university project would be placed in their college folder. In addition, students in the

norm groups were also given a financial incentive of $5.00.

We also confronted the motivational question in another way. Previous to the administration of the URE a questionnaire was going out to all MAP students to gather a response to the counseling program available through MAP. Included in the questionnaire was a question which might give some indication of the motivation of students in the MAP project. The question that was asked was "To what extent have you been motivated during this year by the possibility of a time-shortened baccalaureate?" If the response indicated high motivation, one could infer that students would be highly motivated to do well on the URE since that would be critical to the attainment of advanced status. The four alternative responses and the frequency percentage associated with each are reported below (77 of the 127 students who took the URE responded to this questionnaire).

| | |
|---|---|
| 33% | Very much, it has been uppermost in my mind. |
| 43% | Somewhat, there have been other important considerations. |
| 18% | Clearly it has been of secondary importance to me. |
| 6% | Not at all, it has rarely occured to me. |

This response would suggest that the possibility of a time-shortened degree was not the over-bearing motivating factor for all students in MAP.

## Map and Normative Groups

The first analysis reports the mean and standard deviations for each of the individual examinations. These are reported in Table 2. In each case we find that the MAP population scored between the freshmen and sophomore norm group. Also in each case the MAP score was closer to the freshmen norm group than the sophomore norm group.

Table 2: Mean Scores and Standard Deviations for the Undergraduate Record Exams

| | Social Science | Humanities | Natural Science |
|---|---|---|---|
| Freshmen Norm Group (N = 60) | 420 (77) | 454 (65) | 509 (81) |
| MAP (N = 127) | 427 (68) | 461 (74) | 519 (79) |
| Sophomore Norm Group (N = 86) | 456 (94) | 482 (80) | 538 (88) |

Table 3 reports another analysis giving the frequency of MAP Scores in each score range and placing the mean scores of the norm groups alongside of each of these distributions. From this one can gain a perspective on the number of MAP students who scored above the mean scores of the two norm groups.

Table 3: Frequency of MAP Scores and Norm Group Means

| Score Ranges | Social Science | Humanities | Natural Science |
|---|---|---|---|
| 700-710 | | | 1 |
| 680-690 | | 1 | |
| 660-670 | | | 2 |
| 640-650 | | 2 | 10 |
| 620-630 | | 1 | 4 |
| 600-610 | | 2 | 6 |
| 580-590 | 1 | 1 | 5 |
| 560-570 | 1 | 10 | 18 |
| 540-550 | 6 | 3 | 11 **(538) |
| 520-530 | 5 | 6 | 10 |
| 500-510 | 10 | 12 | 10 *(509) |
| 480-490 | 9 | 15 **(482) | 13 |
| 460-470 | 15 | 16 | 8 |
| 440-450 | 11 **(456) | 8 *(454) | 6 |
| 420-430 | 11 *(420) | 10 | 13 |
| 400-410 | 17 | 12 | 3 |
| 380-390 | 8 | 12 | 3 |
| 360-370 | 12 | 9 | 6 |
| 340-350 | 10 | 4 | |
| 320-330 | 6 | 3 | |
| 300-310 | 4 | | |
| 280-290 | | | |
| 260-270 | 1 | | |

* = freshman mean
** = sophomore mean

## Comparison with National Norms

Although there was no necessity to analyze the data in these terms because the primary reason for administering the evaluation instrument (URE) was to determine a student's acceptability for junior status, it seemed worthwhile to see how students in MAP would compare with a national sample of freshmen and sophomores.

The students in the national sample took the URE between 1969 and 1971. The sample size for the freshmen group was approximately 1500. Approximately 11,000 students are included in the sophomore sample. The mean scores and standard deviations for these samples and the MAP population are reported in Table 4. The mean scores from MAP are higher than either the freshmen or sophomore national samples. This difference is especially striking in the area of natural science (over one-half of a standard deviation).

Table 4: Mean Scores and Standard Deviation for National Sample and MAP Students

| | Social Science | Humanities | Natural Science |
|---|---|---|---|
| Freshmen | 389<br>(92) | 421<br>(84) | 434<br>(93) |
| Sophomores | 414<br>(88) | 459<br>(84) | 471<br>(88) |
| MAP Students | 427<br>(68) | 461<br>(74) | 519<br>(79) |

Upon further examination of the data, the mean score of the MAP students was at the 68th percentile of the freshman sample and the 50th percentile of the sophomore sample. On the natural science exam it was the 70th percentile of the sophomore sample and at the 82nd percentile of the freshman sample. On the social science exam it was at the 68th percentile on the freshman and the 60th percentile of the sophomore class. These percentiles are reported in Table 5. Such comparisons would suggest that MAP students placed relatively high in relation to freshman and sophomore norm groups nationally.

Table 5: Percent of Students in National Sample Scoring lower than the Mean Score of MAP Students on the URE

| | Social Science | Humanities | Natural Science |
|---|---|---|---|
| Freshman | 68% | 68% | 82% |
| Sophomores | 59% | 50% | 70% |

By Curricular Track

The data was analyzed in yet another way, by sorting MAP students according to their exact curricular experience, i.e. the sequence of courses or quarters which they completed during their freshman year.

All students in MAP took the Little College, then had a choice between the Humanities Cluster, the Humanities Coordinated Quarter, or a self-structured quarter in the winter term. In the Spring they had the choice of either the Science Cluster or a self-structured quarter. This combination resulted in a possibility of six different curricular tracks. We then looked at the data to see if any one track stood out as having included students performing significantly better on the Undergraduate Record Exams than other tracks. Only four of the six possible tracks were used in the analysis; the two not used had populations of less than 10. These results are reported in Table 6. We found no statistically significant difference in performance between the groups using analysis of variance. The range of scores for all four groups was not large on any of the three exams (Social Science = 23, Humanities = 16, Natural Science = 10).

Table 6: Mean Scores on Undergraduate Record Exams by Curriculum

| | Social Science | Humanities | Natural Science |
|---|---|---|---|
| Curriculum 1: (LC, HCC, SCC) N = 38 | 421 | 472 | 518 |
| Curriculum 2: (LC, HCC, SS) N = 37 | 433 | 461 | 528 |
| Curriculum 3: (LC, HCQ, SCC) N = 22 | 426 | 463 | 519 |
| Curriculum 4: (LC, SS, SS) N = 19 | 444 | 456 | 522 |

LC = Little College
HCC = Humanities Cluster College
HCQ = Humanities Coordinated Quarter
SCC = Science Cluster College
SS = Self-Structured Program

## Discussion

To begin with, it is important to realize that the decision to use the Undergraduate Record Examinations as the primary criterion for recommending students who should receive advanced status at the university, and as an evaluative tool, was a compromise that was made in the absence of more appropriate measurements for the MAP curriculum. The URE deals more with factual information and specific content than the process-oriented classes of MAP included. Critical-thinking skills and problem-solving techniques were tested indirectly on the URE while they were the direct focus of most MAP endeavors. The URE was chosen to guarantee to the larger academic community that students who were recommended for advanced status had not only achieved highly in MAP courses, but did not suffer when compared to the achievement levels of students who had attained junior status through a more conventional route.

This proved to be the case. MAP students as a group scored between the freshman and sophomore norm groups which were recruited in a random fashion.

When compared to national norms, the MAP students did very well, scoring higher as a group than sophomores in a national sample.

No large differences appeared among students when they were compared according to their exact curricular experience. However, this should be interpreted carefully, remembering that the MAP curricular objectives did not serve as the basis for the exam. Also, one might expect other findings. Students who were in self-structured schedules

probably had more social science courses than students who took MAP courses. Students not taking the Science Cluster College were often science majors and might be expected to perform better on such an exam. Taking this into consideration, the fact that there were no significant differences between the groups might be viewed as a positive finding.

In summary, the URE was a useful instrument for the purposes MAP needed to have served. The problem of motivation for the non-MAP students is one that can be dealt with in the future by allowing all students to become candidates for the time-shortened degree (a notion included in the second-year evaluation plan.) In the next few years MAP will be following the programs of students who performed at a high level on the URE. That should prove to be an equally useful study.

October 1973